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# THE GYPSY MOTH





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Close-up of *a*, ovipositing female; *b*, male; *c*, female pupa; *d*, male pupa; *e*, old egg mass. Larvae on oak leaf: *f*, First instar; *g*, second instar; *b*, fourth instar; *i*, sixth instar, or mature larva. Egg masses, *k*, under branches and on rock; *l*, young larvae spinning down. (*a* to *i*, about natural size; *k* and *l*, reduced.)

# THE GYPSY MOTH

The gypsy moth, a serious pest of trees in the Northeastern United States, continues to threaten the Nation's hardwood forests. Gypsy moth caterpillars strip the leaves from approximately 400,000 acres of timber a year. In 1953, one and a half million acres of woodland were defoliated. This damage, coupled with necessary control measures, is very costly. And the cost would spiral upward if the moths spread to the Allegheny, Appalachian, and Ozark Mountain regions, where much of the Nation's hardwood timberland is located. These areas contain more than 112 million acres of trees that are highly susceptible to damage by the gypsy moth.

A native of Europe, the gypsy moth was accidentally introduced into America in 1869, when imported specimens escaped from the laboratory of a Medford, Mass., naturalist. Without natural enemies to contain it, the moth spread rapidly and now inhabits most of New England, eastern New York, New Jersey, and eastern Pennsylvania.

## DAMAGE

Gypsy moth caterpillars feed on the leaves of forest, shade, and fruit trees, as well as on many ornamentals. A single defoliation by caterpillars can

kill white pine, spruce, and hemlock. Two defoliations can kill hardwoods. In heavily infested areas caterpillars can quickly strip the leaves from whole forests. This damage, in turn, increases fire and erosion hazards, affects the flow of streams, reduces land and recreational values, and destroys wildlife habitats. Crawling caterpillars are a nuisance in residential and recreational areas.

## DEVELOPMENT AND HABITS

The gypsy moth develops in four stages—egg, larva (caterpillar), pupa (resting stage), and moth. Only the larva is destructive.

The insects pass the winter as velvety, buff-colored egg masses attached to trees, leaves, stone walls, rocks, and other shaded objects. Caterpillars hatch in late April or early May. They soon devour all the leaves in the vicinity and move on to new trees. The brownish, hairy caterpillar is easy to identify by the pairs of red and blue dots on its back.

Caterpillars enter a resting or pupal stage in late June. In 10 to 14 days the insects emerge from their pupal cases as moths. Male moths have dark-brown



forewings, have a 1½-inch wing-spread, and are strong fliers. Female moths are white with black wing markings, are much larger than the males, and do not fly.

## COOPERATIVE PROGRAMS

Since 1906, the States and the U.S. Department of Agriculture have been working together to control and prevent the spread of the gypsy moth. The four types of Federal-State cooperative programs are—(1) survey, (2) regulatory, (3) control, and (4) methods improvement investigations.

### Survey

Gypsy moth surveys provide information on the occurrence, abundance, and extent of damage caused by this pest. This information helps Federal and State officials to plan and conduct control and regulatory work. It also aids USDA scientists who are seeking new and better methods of combating gypsy moths.

In a generally infested area, aerial surveys determine the percentage of acreage defoliated by the moths. The extent of damage in any particular location, however, can be determined only by on-the-spot inspection.

Traps are the most economical and effective means of detecting new infestations. The number of traps used is based on nearness to known infested areas. The traps, which resemble paper cups, contain a sex attractant and are attached to trees. Once inside a trap, the



Baited trap used to find infestation.

insects become entangled in a sticky substance and are unable to escape.

### Regulatory

By regulating the movement of materials that can carry the pest from infested to noninfested areas, Federal and State quarantines are designed to prevent accidental spread of the gypsy moth. Such materials include timber and timber products, woody plants, stone and quarry products, and Christmas trees and greenery.

Because of the huge number of evergreen trees and branches that move from infested to noninfested areas, the spread of the gypsy moth is a special hazard at Christmastime. These decorative trees and branches may harbor egg clusters of the gypsy moth. Clusters that contain 400 to 500 eggs can cling to logs, fallen branches, live trees, and



other items. Once past the quarantine barrier, a single egg cluster could start new infestations wherever it comes in contact with forest, fruit, and shade trees.

Christmas tree shippers are required to have trees and other greens inspected and certified for movement. Homeowners and other individuals can get information on quarantine regulations from county agents or Federal and State pest-control inspectors.

## Control

Objectives of present insecticide control work are to—

- Retard and stop the spread of the moth.
- Eradicate localized infestations outside the generally infested area.
- Prevent serious damage.



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Egg masses on tree.

Until 1961, DDT was used to control or eradicate gypsy moths. Now an insecticide called carbaryl has come into use. It breaks down quicker than DDT, leaving no residue in milk or on pasturelands or crops. It is low in toxicity to humans, birds, other warm-blooded animals, and fish.

When planning control and eradication programs, Federal and State pest-control officials give prime consideration to the safety and health of people, crops, livestock, and wildlife. They avoid spraying lakes, rivers, and reservoirs. To further assure safe and accurate insecticide treatments, they use radio communication, balloons, flares, and other guidance measures when making aerial treatments.

## Methods Improvement

Today, as in the past, control programs must depend primarily on chemical pesticides. But scientists of the Plant Protection Division of USDA's Agricultural Research Service are testing a variety of nonchemical methods for combating the moth.

Three species of parasites—a fly and two wasps—were recently shipped from Spain for establishment in this country. To insure that they will not eventually become pests themselves, these natural enemies are thoroughly screened before being imported.

Disease-producing micro-organisms are being explored as potential control tools. Progress has also been made with releases of male moths that have been sterilized as pupae with precise dosages of gamma radiation.



Prepared from information supplied by Plant Protection Division,  
Agricultural Research Service.



This program aid supersedes Program Aid 530, "The Gypsy Moth  
Menaces Our Living Resources."

☆ U.S. GOVERNMENT PRINTING OFFICE: 1970 O-407-808

WASHINGTON, D.C.

Slightly revised December 1970

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For sale by the Superintendent of Documents, U.S. Government Printing Office  
Washington, D.C. 20402 - Price 20 cents

